A SYNOPTIC VIEW OF THE MAGELLANIC CLOUDS:
VMC, GAIA AND BEYOND

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Exploring origins of stellar substructures in the Magellanic Periphery using 3D kinematics

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Recent panoramic maps of the Magellanic system, made using deep imaging with the Dark Energy Camera, have revealed a wealth of low-surface-brightness stellar substructures in the Magellanic periphery.
Using 2dF+AAOmega on the Anglo-Australian Telescope, we have instigated a large-scale spectroscopic follow-up of stars in these features. We are able to detect the kinematic signature of the Clouds up to projected distances of 23 degrees from the centre of the Large Magellanic Cloud. Combining our spectroscopically derived radial velocities with Gaia DR2 astrometry provides the first 3D kinematics for these regions. Our initial set of measurements, along a large substructure to the north of the LMC, reveal radial velocities near the extremity of the substructure are significantly different from those expected from an extrapolation of the LMC rotation curve; this discrepancy may indicate a strong warp in the LMC disk. Our ultimate aim is to use these 3D kinematics to assess dynamical models of the Clouds; this will provide new insight into the origin of the substructures, and the interaction history of the Clouds.